

CLAIMS:

1. Method of signal reconstruction comprising a dynamic range control processing of an input signal of an image to generate an output signal of the image, the method comprising the steps of:
 - providing the input signal;
 - 5 - determining an amount by:
 - specifying an input range of the input signal, and
 - specifying an output range of the output signal,
 - selecting a convex function as a non-linear transfer characteristic capable of compressing the input signal according to the amount of dynamic range control processing;
 - 10 - processing the input signal wherein the input signal is transferred by means of the convex function;
 - generating the output signal as a result of the processing.
2. The method according to claim 1, characterized in that at least a peak value
15 and/or an exposure average value taken from the signal is used to determine the input range and/or the output range, in particular taken by measurement and/or histogram analysis of the signal, in particular taken from a luminance signal.
3. The method according to claim 1 or 2, characterized in that the input signal is
20 compressed if a peak value of the input signal exceeds the output range.
4. The method as claimed in any one of claims 1 to 3, characterized in that the input signal is compressed with regard to a mere fraction of the image.
- 25 5. The method as claimed in one of the preceding claims, characterized in that the convex function is selected depending on the input range and/or the output range.
6. The method as claimed in one of the preceding claims, characterized in that the convex function is formed by at least a first and a second part having a kneepoint as a

point of intersection of the first and the second part wherein the first part of the convex function has an average steepness exceeding the average steepness of the second part.

7. The method as claimed in claim 6, characterized in that the kneepoint is
5 located on the convex function at a specified kneelevel separating the first part and the second part.
8. The method as claimed in claims 6 or 7, characterized in that each of the first
10 and the second part of the convex function is formed by a linear function having a constant steepness.
9. The method as claimed in any one of claims 6 to 8, characterized in that the
15 convex function is selected by varying the steepness of the second part, in particular by simultaneously keeping the kneelevel constant.
10. The method as claimed in any one of claims 6 to 8, characterized in that the
convex function is selected by varying the kneelevel of the convex function, in particular by simultaneously keeping the steepness of the second part constant.
- 20 11. The method as claimed in any one of claims 6 to 10, characterized in that the convex function is selected depending on the input and/or the output range, wherein a combination of varying the steepness and varying the kneelevel is available.
12. The method as claimed in any one of claims 6 to 11, characterized in that
25 varying the steepness of the second part is selected if the input range of the input signal exceeds a pre-determined threshold level.
13. The method as claimed in any one of the preceding claims, characterized in
30 that the image signal comprises a number of components, in particular a luminance component and/or one or more color components.
14. The method as claimed in claim 13, characterized in that the image signal is formed by a Y-UV-signal or an RGB-signal.

15. The method as claimed in one of the preceding claims, characterized in that the amount of dynamic range control processing is determined on a Y-signal, in particular a Y-signal derived from an R-, G- and B-component or determined on at least one component of an R-, G- or B-component.

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16. The method as claimed in one of the preceding claims, characterized in that the input signal is a digital signal.

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17. The method as claimed in claim 16, characterized in that the digital signal is received from a white signal balancing module and, in particular, the output signal is applied to a gamma-control module.

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18. The method as claimed in any one of the claims 16 or 17, characterized in that an amount of compression range is commonly applied to all components of the image signal for dynamic range control processing and/or the components are processed by means of a convex function common to all components of the image signal.

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19. The method as claimed in any one of claims 1 to 15, characterized in that the input signal is an analog signal.

20. The method as claimed in any one of claims 1 to 15 and claim 19, characterized in that the input signal is received from a sensor, in particular a sensor matrix and, in particular, the output signal is applied to an analog digital converter.

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21. The method as claimed in any one of claims 1 to 15 and 19 to 20, characterized in that at least one of the components of the image signal is processed by transferring the at least one component by means of a specific convex function according to a pre-determined amount of dynamic range control processing, which has been determined specifically for the at least one component.

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22. The method as claimed in any one of the preceding claims, characterized in that the steepness, and/or the kneelevel and/or the input range is determined from a specific signal component, in particular a luminance signal, and is selected for all signal components.

23. The method as claimed in any one of the preceding claims, characterized in that the steepness, and/or the kneelevel and/or the input range is selected according to a sensor matrix and/or a temperature value of the image for each component of the signal, in particular for a color component.

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24. The method as claimed in any one of claims 1 to 15 and 19 to 23, characterized in that the input range and/or the output range is determined from a digital signal.

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25. The method as claimed in any one of claims 1 to 15 and 19 to 24, characterized in that an exposure measurement is provided in a loop in parallel with the dynamic range control processing.

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26. The method as claimed in any one of claims 1 to 15 and 19 to 25, characterized in that a white balance control is provided in a loop in parallel with the dynamic range control processing.

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27. The method as claimed in claims 25 or 26, characterized in that original data of the input signal are retrieved and the original data are provided to an exposure measurement and a white balance control.

28. The method as claimed in claim 27, characterized in that the original data of the input signal are retrieved by means of an inverse non-linear transfer characteristic.

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29. The method as claimed in claim 27 and 28, characterized in that the exposure measurement is controlled to assign the maximum output signal amplitude to a peak value of white.

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30. Imaging device for signal reconstruction comprising a means for dynamic range control processing of an input image signal to generate an output image signal, the image device comprising:

- an input means for providing an input signal;
- a means for determining an amount comprising:
 - a means for specifying an input range of the input signal, and

- a means for specifying an output range of the output signal;
- a computing means for selecting a convex function as a non-linear transfer characteristic capable of compressing the input signal according to the amount of dynamic range control processing;
- 5 - a processing means for transferring the input signal by means of the convex function;
- an output means for generating the output signal from the signal received by the processing means.

10 31. Computer program product storable on a medium readable by a computer system, comprising a software code section, which induces the computer system to execute the method as claimed in any one of the preceding method claims when the product is executed on the computer system.

15 32. The computer program product as claimed in claim 31 comprising a module for calculation of a dynamic look-up table for selection of a convex function as a non-linear transfer characteristic depending on at least one of the parameters selected from the group consisting of: peak value, exposure average value, input range, output range and temperature value.

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33. The computer program product as claimed in claims 31 or 32, characterized by a module for calculating an inverse dynamic look-up table as an inverse non-linear transfer characteristic.

25 34. The computer program product as claimed in any one of claims 31 to 33, characterized by a module for calculating a dynamic look-up table and/or an inverse dynamic look-up table if the input signal is an analog signal and which is specifically adapted for at least one component of the input signal.